WHAT IS CLAIMED IS:

1. A system for controlling drill motor rotational speed, comprising:

a downhole motor disposed in a drill string and having a rotor operable to be rotated by a flow of drilling fluid through the motor;

one or more by-pass ports formed in the drill string and operable to allow a portion of the drilling fluid to exit the drill string into a well bore prior to the drilling fluid flowing through the motor;

a governor coupled to the rotor of the downhole motor and comprising a valve, the valve operable to:

move in response to the rotational speed of the rotor, the movement of the valve operable to control the amount of drilling fluid allowed to flow through the one or more by-pass ports and exit the drill string into the well bore prior to the drilling fluid flowing through the motor; and

directly control the flow of the drilling fluid into the motor based on the amount of drilling fluid allowed to flow through the one or more by-pass ports, thereby controlling the rotational speed of the rotor; and

a rotatable downhole device coupled to the motor and operable to be rotated by the downhole motor.

2. The system of Claim 1, wherein the governor is further operable to prevent the rotor from exceeding a predetermined rotational speed.

3. The system of Claim 1, wherein the governor comprises two or more valve weights coupled to the valve, the valve weights operable to rotate at substantially the same speed as the rotor, an axial force generated by the rotation of the valve weights operable to move the valve relative to the one or more by-pass ports.

4. The system of Claim 3, further comprising a valve spring operable to provide an axial force to counteract the axial force generated by the rotation of the valve weights.

5. The system of Claim 4, wherein a spring constant of the valve spring and a mass of the valve weights are selected based on a desired maximum rotational speed of the rotor.

6. The system of Claim 1, wherein the governor is operable to control the rotational speed of the rotor regardless of a variable weight-on-bit of the drill string.

7. The system of Claim 1, wherein the one or more by-pass ports are formed in one or more positions in the drill string such that the flow of drilling fluid out of the drill string through the one or more by-pass ports does not substantially affect a weight-on-bit of the drill string.

8. The system of Claim 1, wherein the rotatable downhole device comprises a drill bit operable to remove portions of a subterranean zone to form the well bore.

9. The system of Claim 1, wherein the governor is disposed at an inlet of the motor.

10. The system of Claim 1, wherein the one or more by-pass ports are formed in the drill string proximate to an inlet of the motor.

11. A method for controlling drill motor rotational speed, comprising:

pumping a drilling fluid through a drill string, the drill string comprising a downhole motor, a governor, and one or more by-pass ports;

rotating a rotor of the motor using the flow of the drilling fluid through the motor;

moving a valve of the governor in response to the rotational speed of the rotor such that the movement of the valve controls the amount of drilling fluid allowed to flow through the one or more by-pass ports and exit the drill string into the well bore prior to the drilling fluid flowing through the motor to directly control the flow of the drilling fluid into the motor and the rotational speed of the rotor.

12. The method of Claim 11, further comprising preventing the rotor from exceeding a predetermined rotational speed.

13. The method of Claim 12, wherein:

the governor comprises two or more valve weights coupled to the valve, the valve weights operable to rotate at substantially the same speed as the rotor; and

the method further comprises:

generating an axial force on the valve by rotating the valve weights;

moving the valve relative to the one or more by-pass ports in response to the axial force to control the flow of at least a portion of the drilling fluid through the one or more by-pass ports.

14. The method of Claim 13, further comprising providing an axial force using a valve spring to counteract the axial force generated by rotating the valve weights.

15. The method of Claim 14, further comprising selecting a spring constant of the valve spring and a mass of the valve weights based on a desired maximum rotational speed of the rotor.

16. The method of Claim 11, further comprising controlling the rotational speed of the rotor regardless of a variable weight-on-bit of the drill string.

17. The method of Claim 11, wherein the one or more by-pass ports are formed in one or more positions in the drill string such that the flow of drilling fluid out of the drill string through the one or more by-pass ports does not substantially affect a weight-on-bit of the drill string.

18. The method of Claim 11, wherein the rotatable downhole device comprises a drill bit operable to remove portions of a subterranean zone to form the well bore.

19. The method of Claim 11, wherein the governor is disposed at an inlet of the motor.

20. The method of Claim 11, wherein the one or more by-pass ports are formed in the drill string proximate to an inlet of the motor.

21. A system for controlling drill motor rotational speed, comprising:

a motive means disposed in a drill string and having a rotating means operable to be rotated by a flow of drilling fluid through the motive means;

one or more fluid by-pass means formed in the drill string and operable to allow a portion of the drilling fluid to exit the drill string into a well bore prior to the drilling fluid flowing through the motor;

a governing means coupled to the rotating means of the motive means and comprising a valve means, the valve means operable to:

move in response to the rotational speed of the rotating means, the movement of the valve means operable to control the amount of drilling fluid allowed to flow through the one or more fluid by-pass means and exit the drill string into the well bore prior to the drilling fluid flowing through the motor; and

directly control the flow of the drilling fluid into the motive means based on the amount of drilling fluid allowed to flow through the one or more fluid by-pass means, thereby controlling the rotational speed of the rotating means; and

a drilling means coupled to the motive means and operable to be rotated by the motive means.

22. A system for controlling drill motor rotational speed, comprising:

a downhole motor disposed in a drill string and having a rotor operable to be rotated by a flow of drilling fluid through the motor;

one or more by-pass ports formed in the drill string and operable to allow a portion of the drilling fluid to exit the drill string into a well bore prior to the drilling fluid flowing through the motor; and

a governor disposed at an inlet to the downhole motor and coupled to the rotor of the downhole motor, the governor operable to prevent the rotor from exceeding a predetermined speed, the governor comprising:

a valve operable to:

move in response to the rotational speed of the rotor, the movement of the valve operable to control the amount of drilling fluid allowed to flow through the one or more by-pass ports and exit the drill string into the well bore; and

directly control the flow of the drilling fluid into the motor based on the amount of drilling fluid allowed to flow through the one or more by-pass ports, thereby controlling the rotational speed of the rotor; and

two or more valve weights coupled to the valve, the valve weights operable to rotate at substantially the same speed as the rotor, an axial force generated by the rotation of the valve weights operable to move the valve relative to the one or more by-pass ports.